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A NEW SPECIES OF *ARBUTUS* (ERICACEAE) FROM WESTERN MEXICO

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The species-complex for which the oldest name is *Arbutus menziesii* Pursh varies to such an extent over a wide geographical range that there has been no general agreement upon the delimitation of taxa of specific or infraspecific rank within the complex. More or less distinguishable regional populations have been treated as species, e.g. *Arbutus menziesii* Pursh from California to British Columbia, *A. peninsularis* Rose & Goldman in Baja California, *A. arizonica* (A. Gray) Sarg. in southwestern United States and northern Mexico, *A. texana* Buckl. in Texas, New Mexico, and adjacent Mexico, and *A. xalapensis* H.B.K. throughout most of Mexico. Some of the same populations have been given varietal names under *A. menziesii* or *A. xalapensis.* Standley (Contr. U.S. Nat. Herb. 23: 1099. 1924) recognized 7 species in Mexico, saying at the same time, "It appears probable that ultimately all of them will have to be considered mere forms of *A. xalapensis.*" In the more than 50 years since Standley's opinion was published, there has been no significant increase in our knowledge of these trees that comprise an important element of the montane forests in most parts of Mexico. A revision of the entire complex is needed. It is therefore with some trepidation that we describe and name what seems to be a distinct taxon that has been passing as a part of the complex, and indeed has been confused with *A. xalapensis* (sensu lato) when any attempt has been made to determine specimens of it.

In passing it may be noted that at least two of the species included by Standley are apparently not conspecific with *A. xalapensis.*

Arbutus spinulosa Mart. & Gal. (Bull. Acad. Brux. 9, pt. 1: 532. 1842), of which the type (*Galeotti 1836*) came from an elevation between 7000 and 8000 feet on the north side of Cerro Tancítaro, was described as fruticose, with oblong-lanceolate leaves 5 inches long, 8–10 lines wide, spinulose-denticulate, ashy-pubescent beneath, the racemes congested, subpaniculate, pubescent-tomentose, with linear bracts longer than the pedicels. We suspected that this might be identical with our var. *villosa*, described below. Through the kindness of the authorities at Brussels (BR) we have been able to examine the type of *A. spinulosa,* which proves to represent not a species of *Arbutus,* but the narrow-leaved, non-glandular plant currently passing under the name of *Arctostaphylos rupestris* Rob. & Seat. (Proc. Amer. Acad. 28: 112. 1893). The name *Arbutus spinulosa* cannot be transferred to *Arctostaphylos* because of the existence of *Arctostaphylos spinulosa* Mart. & Gal. (Bull. Acad. Brux. 9, pt. 1: 537. 1842).

Arbutus glandulosa Mart. & Gal. (Bull. Acad. Brux. 9, pt. 1: 533. 1842), based on *Galeotti 1832,* from Ejutla, Oaxaca, was described as having the branches, petioles, and peduncles hirsute-tomentose with dark, glandular hairs, and the leaves spinulose-denticulate and cordate at base. We have not seen the type, but a tree answering this description is common in western Mexico, and seems strikingly different from everything in the complex of *A. xalapensis.* Most parts of the plant are copiously beset with gland-tipped setae (1–) 2–4 (–7) mm long, much longer than the delicate upright nonglandular hairs that are mingled with them. This glandular-hirsute plant often grows in association with the so-called *A. xalapensis,* and is usually readily distinguishable from that species by the glandular-setose herbage, by its flowering season, which seems to be consistently 3–4 weeks earlier than that of *A. xalapensis,* and by its rough, flaking, but persistent bark, which often contrasts markedly with the smooth lustrous bark of *A. xalapensis* that results from the loosening of the outer layers. The plant that we are calling *A. glandulosa* is often the most abundant *Arbutus* in mountain forests in western Mexico from Chihuahua southward.

Collectors in western Mexico have recently been noting the occurrence of an *Arbutus* which is always a small shrub, in contrast to *A. xalapensis* which is usually treelike and sometimes very large, with trunk occasionally up to 1 m in diameter, and a height of 15 m or more. Material of this shrubby plant seems to differ consistently in a number of ways from plants of the *A. xalapensis*-complex, and we propose to treat it as a distinct species, distinguished as follows:

1. **Habit.** We considered and rejected the possibility that the shrubby habit is not genetically fixed, i.e. that collectors had taken specimens that were in fact flowering shoots from stumps of larger trees that had been cut. In at least three widely separated areas collectors have commented on the habit in ways that seem to show conclusively that the plants are not treelike: In western Durango, "a prostrate, much branched shrub" (*Ownbey & Ownbey 1868*); "prostrate shrub less than 1 [foot] high, to 4 [feet] wide" (*Kimnach & Brandt 1204*); "shrub, 2 ft. forming colonies, decumbent" (*Lundell 13016*); "shrub 30 cm high in colonies" (*McVaugh 11531*). In Jalisco, "colonial shrub 30–50 cm high" (*McVaugh 23129*); "shrub forming low, wide-spreading, colonies 25 cm high . . . handsome groundcover" (*Boutin & Brandt 2537*). In Michoacán and México, "scraggly shrub 1 m high or sprawling on the rocks" (*Hinton 13500*); "total height of plant 50 cm; these branches grow from a large root 50 cm in diameter" (*Hinton 7458*).

2. **Foliage.** Leaves of the shrubby plant are in general smaller, narrower (both relatively and absolutely), more consistently toothed, and with shorter petioles, than those of *A. xalapensis,* sens. lat. Maximum leaf (blade)-length is about 7 cm, and most leaves on flowering shoots are 3–6 cm long (on *A. xalapensis,* as far as we have observed it, the maximum is about 15 cm, and the usual 7–10 cm) (Fig. 1, h). Maximum width of the leaf-blade is about 3 cm, and most leaves are 1–2 cm wide (8.5 cm, and 3–5 cm in *A. xalapensis*). Petioles average about 1 cm long (0.5–2.5), and on the average are about one-fifth as long as the blades; in *A. xalapensis* they average 2.5 cm long [1–4.2 cm], and are about one third as long as the blade. Pubescence, if present on the lower (abaxial) side of the leaf, tends to be generally distributed, whereas in *A. xalapensis* it is rather markedly concentrated toward the midvein. In the shrubby plant the leaves may be entire or toothed in the same colony, but most leaves are finely and uniformly serrulate, whereas in *A. xalapensis,* at least in western Mexico, the leaves are all entire in many specimens.

3. **Flowers.** Flowers are produced in the shrubby plant from January to March, and fruit may be found on the plants from June to November. The corollas are 4–5 mm long (average 4.66 mm), and are described as "faint pink," "bright pink," "red," "pale pink, darker distally and on lobes," or "creamy white with pink blush." In *A. xalapensis* as represented in western Mexico, the flowering season extends from early October to February, and fruit may be found from October through the following summer. The corollas are 5–6 mm long (average 5.86 mm), and are described as white or cream color, greenish yellow or green distally (Fig. 1, i, j).

4. **Floral bracts.** In the shrubby plant these are (4–) 4.7 (–7) mm long, about equalling or longer than the corolla; in *A. xalapensis* they are (3–) 3.4 (–4) mm long, shorter than the corolla (Fig. 1, i).

5. **Fruit.** The berries in the shrubby plant are 4.5–8 mm in diameter as far as known, and those in *A. xalapensis* 8–10 mm.

In summary, the shrubby plant differs from the complex of *A. xalapensis* not only in habit, but in leaf-shape and -margin, leaf-size, petiole-length and blade/petiole ratio, and distribution of pubescence on the leaves; in inflorescence characters there are differences in length of flowering season, in flower-size and -color, in fruit-size, and in the ratio between bract-size and flower-size. We believe this combination of features justifies the recognition of the shrubby plant as an independent species:

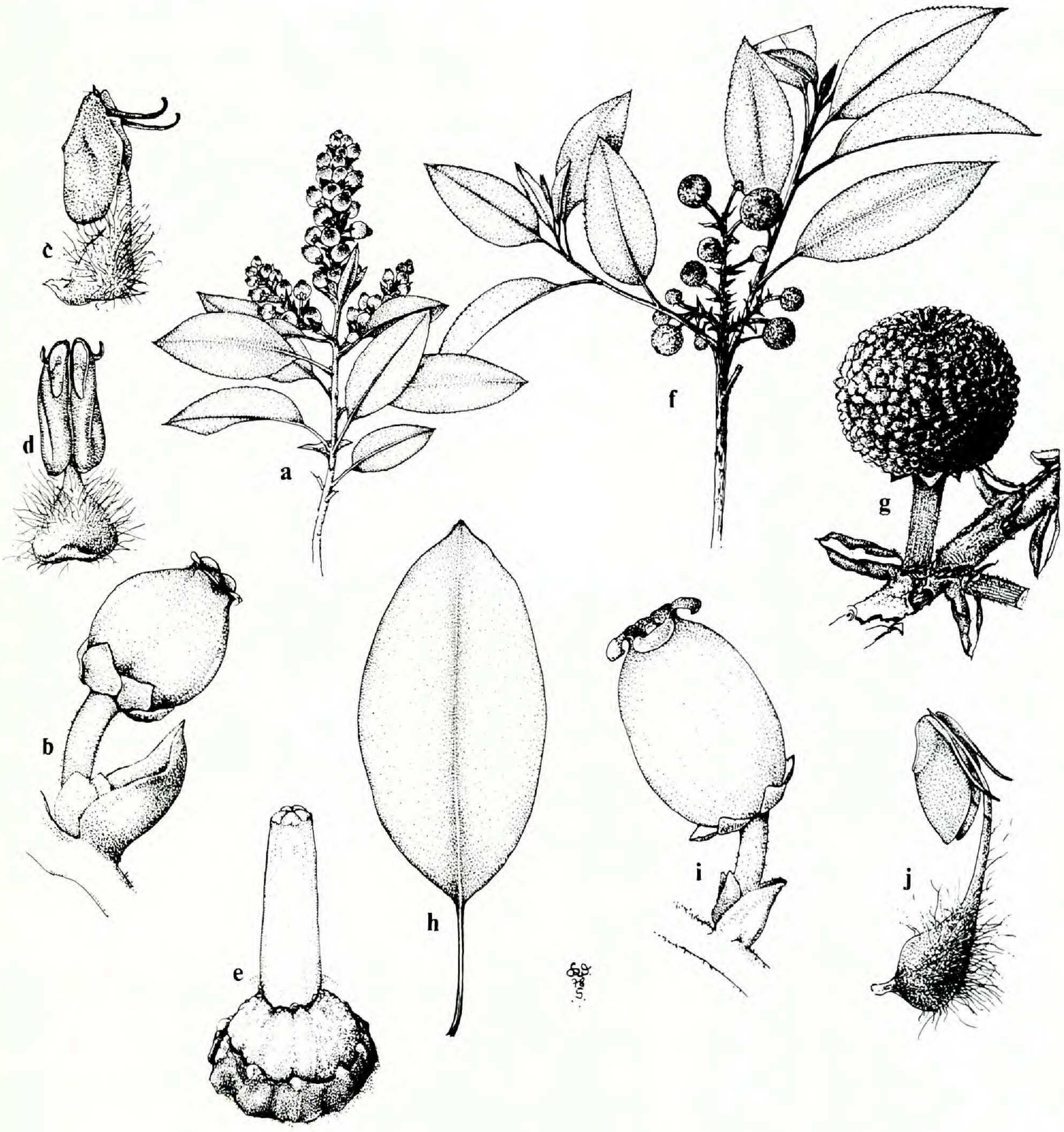

FIG. 1. *Arbutus occidentalis* and *A. xalapensis.* a–e, *A. occidentalis,* var. *occidentalis,* from the type. a, flowering twig × 0.5; b, flower and bract × 3.5; c, d, lateral and adaxial views of anther × 10; e, ovary and disk × 10. f, g, var. *occidentalis,* from *McVaugh 21697.* f, fruiting twig × 0.5; g, fruit and bracts × 3. h–j, *A. xalapensis,* from *McVaugh 14271,* Jalisco. h, leaf × 0.5; i, flower and bract × 3.5; j, anther × 10. Drawings by Karin Douthit.

Arbutus occidentalis McVaugh & Rosatti, sp. nov., frutex colonialis vix metralis, foliis ellipticis raro ovatis, plerumque serrulatis, 7 cm longis vel brevioribus, quam petiolis ca. 5-plo longioribus; laminae glabrae vel subtus omnino sublanosae, acuminatae vel acutae, basi plerumque obtusae; petioli (0.5–) 1 (–2.5) cm longi; inflorescentia terminalis racemosa 3–7 cm longa vel prope basin 1–3-ramosa; flores albi vel roseati, corollis 4–5 mm longis, bracteis (4–) 4.7 (–7) mm longis, quam corollis saepe longioribus; ovarium 5-loculare; loculis multiovulatis; ovula quoque loculo ca 10, biseriata axillaria; fructus diametro 4.5–8 mm rubri, ca 10-spermi, endocarpio coriaceo, seminibus 1.5–2 mm longis.

A shrub commonly 0.25–1 (sometimes to 1.4) m high, forming colonies up to 2 m wide or more; bark thin, red to red-brown, exfoliating; leaves mostly 3–6 cm long

and 1–2 cm wide, ca 2.5 times as long as wide; serrulations fine and sharp, seldom blunt, commonly extending nearly the whole length of the blade or the leaves sometimes even on the same plant partly or wholly entire; inflorescence often simple, the lateral branches, if any, often shorter, sub-basal; bracts ovate, more or less clasping, reddish or scarious, acute or obtuse, mostly 4–6 mm long, exceeding the pedicels in anthesis, but the pedicels in fruit and old flower becoming 5–8 (–15) mm long; anthers 1–1.5 mm long, bicornute; fruit tuberculate, fleshy, not juicy, described as "red," "bright red" or "scarlet," "acid," or "sweet to the taste"; seeds about 2 in each locule, soft, pale brown, ellipsoid-oblong to subglobose, somewhat angled by mutual pressure, finely lineate-reticulate.

Two varieties, morphologically and regionally separated, may be distinguished as follows:

1. Leaves quite glabrous or sparingly pilose beneath; petioles, if pubescent, usually more so adaxially; glandular hairs of the inflorescence inconspicuous or almost wanting; bracts mostly 4–5 mm long; Durango to Jalisco. var. *occidentalis.*
1. Leaves copiously wooly-villous beneath; petioles about equally pubescent on all sides; glandular hairs of the inflorescence numerous and conspicuous; bracts mostly 5–7 mm long; eastern Michoacán to Oaxaca. var. *villosa.*

Arbutus occidentalis McVaugh & Rosatti, var. **occidentalis**. *Arbutus occidentalis* McVaugh & Rosatti, quoad typum. Fig. 1, a–g.

Mountains in pine-, pine-oak, or pine-*Cupressus* forest, spreading on rocks and rocky summits, or steep slopes in open rocky soil, elevation 2100–2750 m.

JALISCO: Autlán, Sierra de Manantlán, along lumber-roads east of the summit between El Chante and Cuzalapa, lat. 19°35′ N., long. 104° 8′–15′ W, summits of cliffs in pine forest, elev. 2750 m, flowering 20–21 March 1965, *McVaugh 23129* (MICH, type).

Additional specimens examined: DURANGO: South and west of El Salto, *Ownbey & Ownbey 1868* (fr Sep), *Kimnach & Brandt 1204* (fr Nov), *McVaugh 11531* (imm fl Mar) (all MICH); north of Coyotes Station, *Maysilles 8397* (lvs Aug), *McVaugh 21697* (fr Sep), *Breedlove 18738* (fr Nov) (all MICH); northeast of Ataes, Distr. Santiago Papasquiaro, *Lundell 13016,* fl Apr (MICH). AUGASCALIENTES: 12 km southwest of La Congoja, Mpio. San José de Gracia, *Rzedowski & McVaugh 799*, lvs Oct (MICH). JALISCO: Near type-locality above abandoned site of El Guízar, "3100 m," *Boutin & Brandt 2537*, fr Nov (MICH).

Arbutus occidentalis McVaugh & Rosatti, var. **villosa** McVaugh & Rosatti, var. nov. a var. *occidentali* foliis subtus copiose villosis, petiolis omnino pubescentibus, bracteis longioribus, inflorescentiis pilis glandulosis conspicue capitatis differt.

Mountains, in pine forest as far as known, spreading on cliff-summits and steep rocky slopes, elevation ?2500–3350 m.

MEXICO: Between Cumbre and Cimientos, Temascaltepec, on cliff in pine forest, flowering 26 Jan 1936, *Hinton 8847* (MICH, type).

Additional specimens examined: MICHOACAN: Between Zitácuaro and Cacique, elev. 3350 m, *Hinton 13500,* fr & bud late Nov (MICH, US). MEXICO: Cajones, Distr. Temascaltepec, *Hinton 7458,* fl Mar (MICH); between Cumbre and Cimientos, *Hinton 8962,* fl Mar (MICH); Almoloya, Distr. Sultepec, *Hinton 15422,* fl Feb (US). OAXACA: Cerro de Humo in Sierra de Juárez, *Alexander 829,* fl Mar (MICH).